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CHEMISTRY

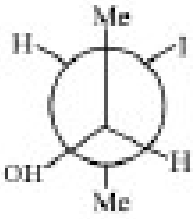
TARGET : JEE Advanced – 2023

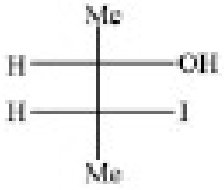
CAPS - 3

Isomerism

SINGLE CHOICE QUESTIONS

1. Which of the following is the diastereoisomers of the compound



(A)


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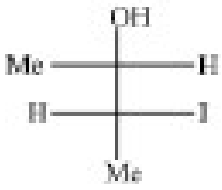
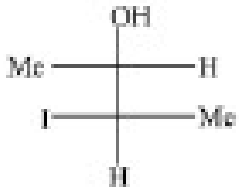
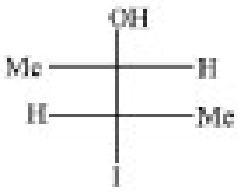
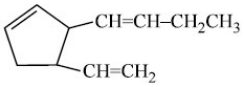


(C)


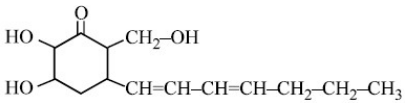
(D)


2. Stereoisomers possible for following compound is



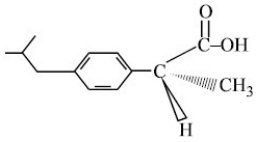
(A) 8 (B) 16 (C) 32 (D) 64

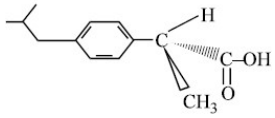
3. How many stereoisomer may have this natural occuring compound.

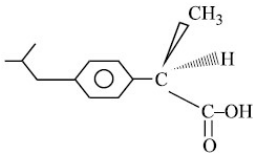


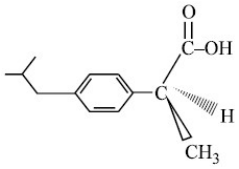
(A) 8 (B) 16 (C) 64 (D) 128

4. The S-enantiomers of ibuprofein is reversible for its pain relieving properties. Which one of the structure shown is S-ibuprofein?

(A)


(B)


(C)


(D)


5. Give the correct order of initials T or F for following statements. Use T if statement is true and F if it is false.

I. Me–CH=C=C=CH–Br is optically active.

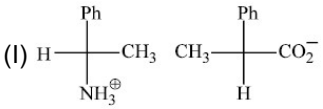
II. All optically active compound are chiral.

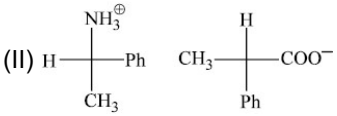
III. All chiral pyramidal molecules are optically inactive.

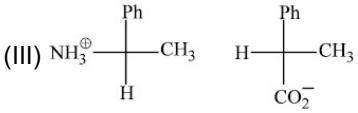
IV $CH_3 - CH_2 - CH_2 - COOH$ and  are positional isomers.

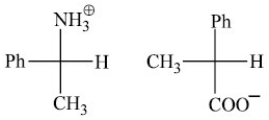
(A) TTTF (B) FTFT (C) FTFF (D) TFTT

6. Which pairs of the salts should have identical solubilities in methanol?

(I) 

(II) 

(III) 

(IV) 

(A) I & IV (B) I & III (C) I & II (D) II & IV

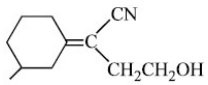
MULTIPLE CHOICE QUESTIONS

7. Which of the following compounds has a stereoisomer that is a meso compound?

(A) 2,4-dibromohexane (B) 2,3-dibromobutane

(C) 2,4-dimethylpentane (D) hexane-2,5-diol

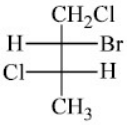
8. True statement(s) about the following compound is/are

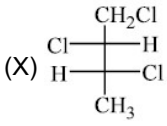


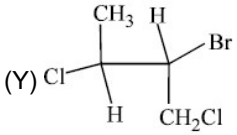
(A) It shows geometrical isomerism (B) It shows optical isomerism

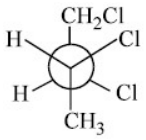
(C) It configuration is E (D) It is having two stereocenters

9. Consider the following statements regarding the given projection and select the correct statement(s)?

(W) 

(X) 

(Y) 

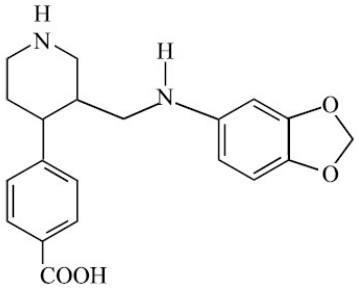
(Z) 

(A) W & Y are diastereoisomers (B) Z is the newmann projection of X

(C) W, X, Y and Z are optically active (D) Y & Z are meso.

INTEGER ANSWER TYPE

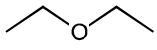
10. Indicate the stereo centres in the following molecule and total number of stereomers in the following molecule.



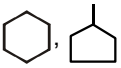
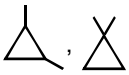
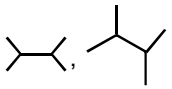
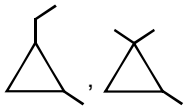
11. The number of structurally isomeric ketones with molecular formula $C_6H_{12}O$ are :

12. The number of structurally isomeric esters with molecular formula $C_5H_{10}O_2$ are.

13. Classify the following compounds as homocyclic, heterocyclic, alicyclic, aliphatic, aromatic, saturated and unsaturated.

(a)  (b)  (c)  (d) 

14. What is the relation between following compounds ?

(a)  (b)  (c)  (d) 

15. Write all structurally isomeric ethers with molecular formula $C_5H_{12}O$.

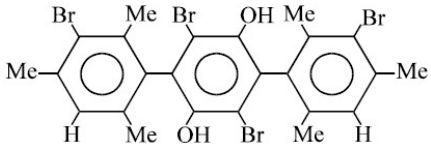
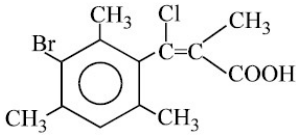
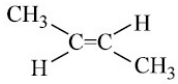
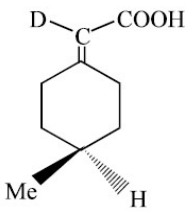
16. What is the number of all (structurally isomeric) alkynes with molecular formula C_6H_{10}.

17. How many aromatic have benzen ring structural isomers are possible for C_7H_8O.

18. Pure (R) Mandelic acid has specific rotation of –150. If a smaple contains 60% of the R and 40% of its enantiomer, then $[\alpha]$ of this solution is.

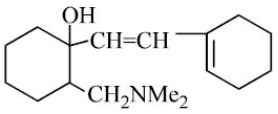
Match the column:

19. **Match the column :**

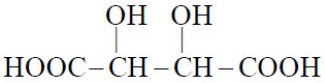
Column I	**Column II**
(A) Compound show geometrical isomerism	(P) 
(B) Compound shows optical isomerism	(Q) 
(C) Compound having plane of symmetry	(R) 
(D) Compound having centre of symmetry	(S) 

SUBJECTIVE ANSWER TYPE

20. How many stereoisomers are possible for following compounds:

(a) 

(b) $CH_3–CH=CH–CH=CH–CH=C=CH_2$

(c) 

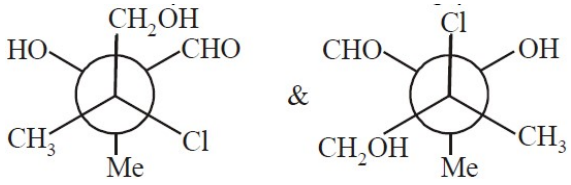
(d) 1,2-dichlorocyclopropane

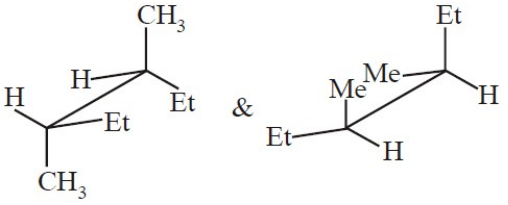
(e) 1,3- dimethylcyclobutane

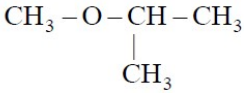
(f) 2-bromo-3- chlorobutane

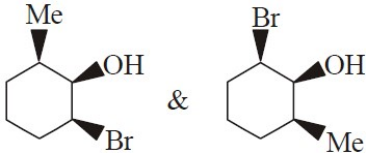
(g) 1,3-dimethyl cyclohexane

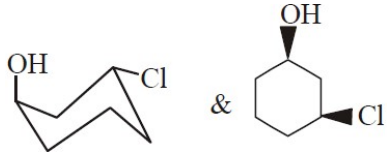
21. Find relationship between following pairs.

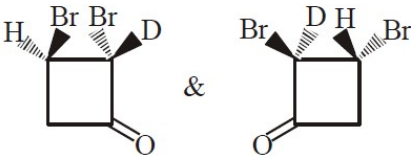
(a) 

(b) 

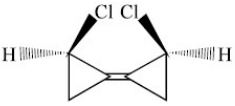
(c) $CH_3–O–CH_2–CH_2CH_3$ & 

(d) 

(e) 

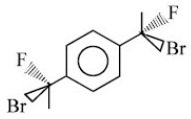
(f) 

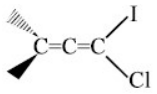
22. Discuss the optical activity of the following two compounds and also label them as polar and non polar.

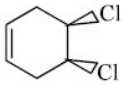
(I) 

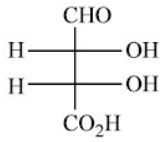
(II) 

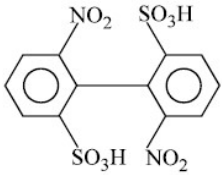
23. Identify chiral and achiral compounds from the list given below.

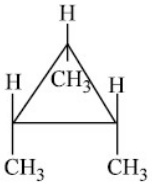
(a) 

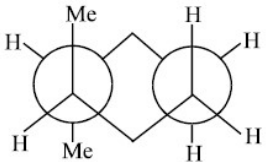
(b) 

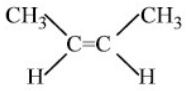
(c) 

(d) 

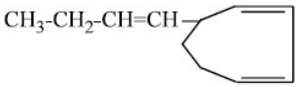
(e) 

(f) 

(g) 

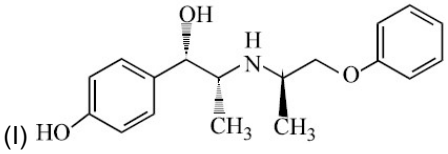
(h) 

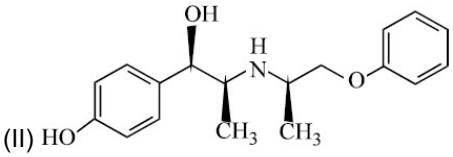
24. Ectocarpene is a volatile, sperm cell attracting material released by the eggs at the sea wood Ectocarpus Siliculosus and is shown below:–

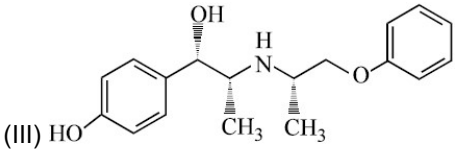


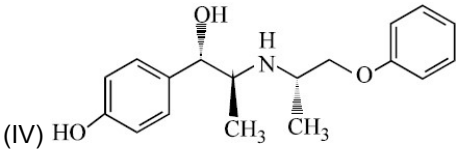
All the double bonds are cis & the absolute configuration of the stereocentre is S. Write a stereo chemically accurate representation of ectocarpene.

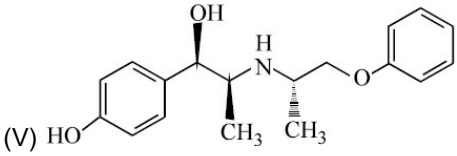
25. Consider the following six structures:

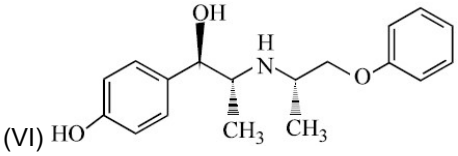
(I) 

(II) 

(III) 

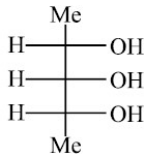
(IV) 

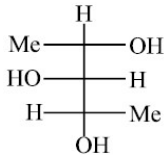
(V) 

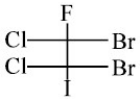
(VI) 

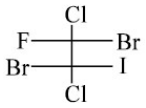
Establish the stereochemical relationship between: (a) I and II, (b) III and IV, (c) II and III, (d) I and V, (e) IV and (VI)

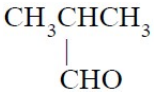
26. Find relationship between following pairs.

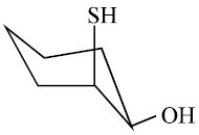
(a)  &

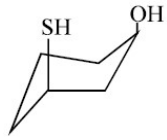


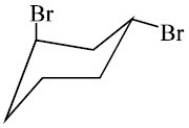
(b)  &

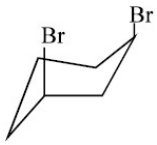


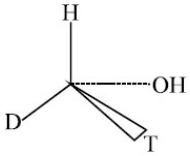
(c) $CH_2CH_2CH_2 - CHO$ &


(d)  &



(e)  &



(f)  &